IR Biotyper®

- Microbial typing for real-time epidemiology

Innovation with Integrity

FT-IR

IR Biotyper -

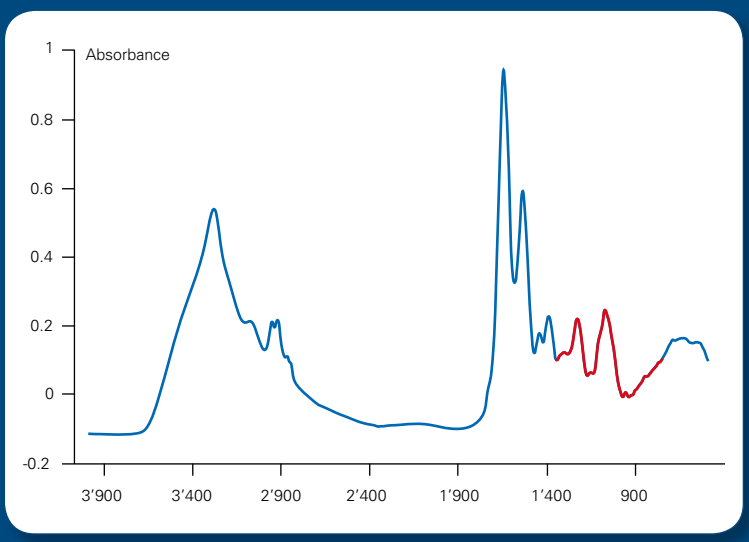
Proactive hospital hygiene and infection control

Fast, easy-to-apply and economical typing methods are in high demand in hospital hygiene management for infection control, epidemiological studies and to better understand the pathogenesis of infection. IR Biotyper is Bruker's infrared spectroscopy solution for subtyping of microorganisms, matching the above needs with excellent discriminatory power comparable to routine molecular genetic methods. The fast and simple workflow allows real-time epidemiology, enabling proactive infection control.

IR spectroscopy is very well suited to subtyping and could ideally be combined with Bruker's MALDI Biotyper MALDI-TOF mass spectrometry system, to meld the strength of rapid and easy microorganism identification via MALDI-TOF with IR subtyping into one workflow.

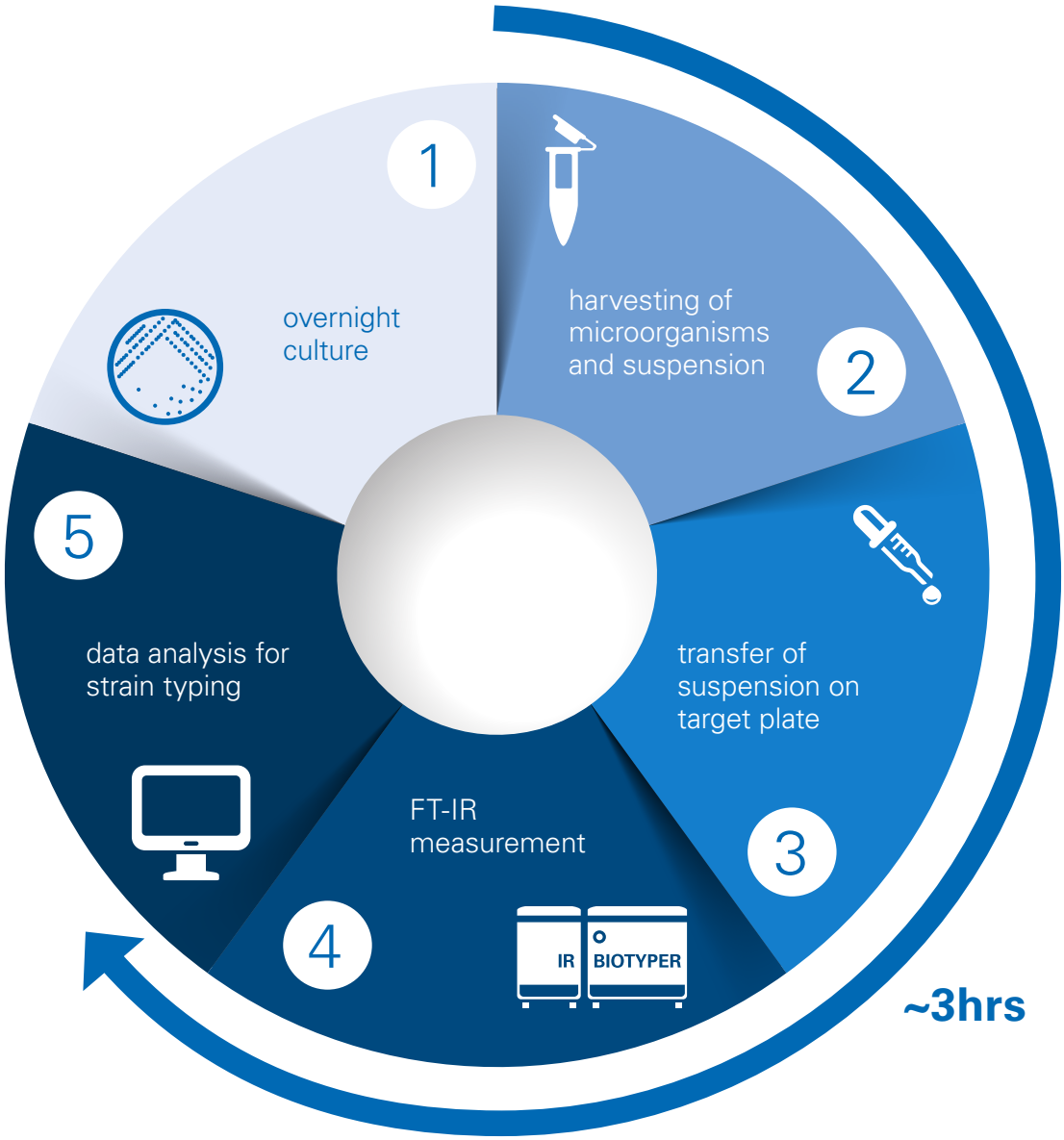
The principle

IR Biotyper is a Fourier Transform Infrared (FT-IR) Spectroscopy system analysing the vibrations of carbohydrate constituents present in many molecules such as glycoproteins. This FT-IR spectrum is like a fingerprint allowing the classification of microorganisms on the subspecies level such as *Streptococcus pneumoniae* serotypes.



The IR Biotyper analyses IR spectra in the wavelength range typical for carbohydrates, as indicated by the colored spectrum area. Spectra are then analysed further for specific subspecies characteristics.

Workflow - Fast and easy



Implementing IR Biotyper in your hospital hygiene management will enhance the analysis of outbreak scenarios. It's fast - the entire process from culture transfer to result needs just three hours - and it's efficient. Up to 30 isolates can be analyzed within one run.

Moreover, the IR Biotyper will enable further analytical studies for improved data-based hygiene management not limited to multi-resistant strains and related outbreaks.

System components including consumables

Part-No. 1845471
IR Biotyper

The IR Biotyper is a spectroscopic system for analysis of microorganism samples.
The system is composed of a high performance FT-IR spectrometer (Fourier Transform Infrared), a high throughput screening extension intended for analyzing silicon microtiter sample plates (96 spots), and software for system control and automatic measurement of spectra.

Management of isolate metadata, creation of runs and data exploration are performed with the IR Biotyper software which features, for example:

- customizable metadata (biological: MLST, PFGE, virulence factors, resistances, etc.; and circumstantial: location, isolation date, matrix, etc.)
- easy measurement run creation via templates
- easy project creation to evaluate isolate relationships
- data exploration with hierarchical cluster analysis (HCA) and result display as dendrogram or distance matrix which can be exported in PNG data format
- two metrics (Euclidean & correlation) and four linkage types (single, average, complete, Ward's) available
- results from principal component analysis (PCA) and linear discriminant analysis (LDA), for enhanced discriminatory power, can be displayed as a scatter plot

Part-No. I23258P
Silicon 96 spot microtiter plates

Set of 5 reusable plates each with 96 positions designed for use with the IR Biotyper.

Part-No. 1851760
IR Biotyper Kit

Includes two bacterial IR Test Standards (IRTS 1 and IRTS 2) for five runs and sample preparation vials for 50 isolates.

Distance matrix and dendrogram

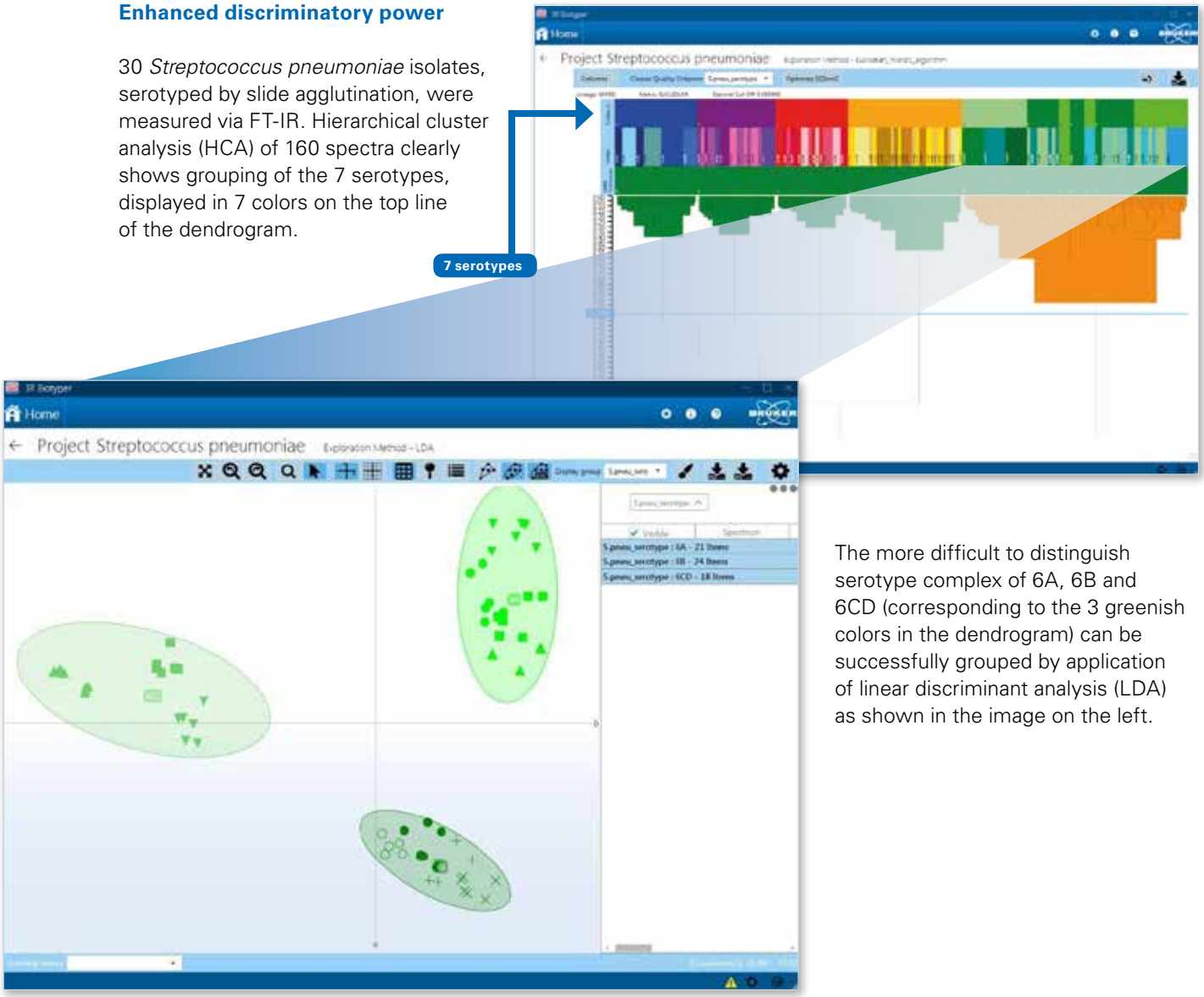
The intuitive user interface facilitates data processing. Clear result reports are provided, applying visualization tools such as dendrogram and distance matrix.

Subtyping results achieved with FT-IR spectroscopy are equivalent to molecular methods. This claim has been demonstrated via a comparative study where over 240 clinical isolates of vancomycin resistant enterococci (VRE) were typed in parallel by MLST (multi locus sequence typing) and IR Biotyper.

NEW - 2D Scatter plot

Enhanced discriminatory power

30 *Streptococcus pneumoniae* isolates, serotyped by slide agglutination, were measured via FT-IR. Hierarchical cluster analysis (HCA) of 160 spectra clearly shows grouping of the 7 serotypes, displayed in 7 colors on the top line of the dendrogram.



The more difficult to distinguish serotype complex of 6A, 6B and 6CD (corresponding to the 3 greenish colors in the dendrogram) can be successfully grouped by application of linear discriminant analysis (LDA) as shown in the image on the left.

Bruker Daltonik GmbH

Bremen · Germany
Phone +49 (0) 421-2205-0

Bruker Scientific LLC

Billerica, MA · USA
Phone +1 (978) 663-3660

ms.sales.bdal@bruker.com - www.bruker.com/microbiology